BULL. BOT. SURV. INDIA
Vol. 8, No. 1 : pp. 42-44, 1966

TAXONOMIC STUDIES IN GENUS *ORYZA*: V. *SCLEROPHYLLUM COARCTATUM* (ROXB.) GRIFF.

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ABSTRACT

The combination *Sclerophyllum coarctatum* (Roxb.) Griff. is invoked for the plants that have generally been known as *Oryza coarctata* Roxb. It is shown that the characters of *Sclerophyllum* Griff. generally fall beyond the range of variation available in genus *Oryza* L. and hence the justification of separation.

Sclerophyllum coarctatum (Roxb.) Griff. Notul. Pl. As. 3:8, 1851. *Oryza coarctata* Buch.-Ham. ex Roxb. Hort. Beng. 87, 1814. *O. triticoides* Griff. Notul. Pl. As. 3:8, 1851, *pro syn.*

Sclerophyllum coarctatum has been considered in the past to be a species of *Oryza* almost by every worker except Griffith (1851), who erected a different genus for it. Present authors had an opportunity to study the genus *Oryza* including *Sclerophyllum* and according to them the latter offers many characters that fall outside the limits of variation of genus *Oryza*. Chalam (1943) Kihara and Katayama (1960), Roy (1963) and Tateoka (1963, 1964) have pointed out the additional distinctive features of *Sclerophyllum*. All these characters are listed in Table I.

Sclerophyllum coarctatum is a species that has never posed any difficulty in its identification. It is well described by several writers (Roxburgh, 1832; Griffith, 1851 ; Hooker, 1897 ; Cooke, 1908 ; Haines, 1924; Fischer, 1934). It occurs in the deltas and estuaries of the rivers Indus, Kali Nadi, Godavari, Subarnarekha, Ganga-Brahmaputra, Irrawaddy and Tenasserim and grows in tidal swamps.

The position of this species in *Oryza* has not been a happy one. It has been grouped in the past along with *Oryza ridleyi* Hook. f., *O. ischlechteri* Pilger and *O. brachyantha* A. Cheval. et Roehr. The grouping of *O. brachyantha* with the former three species has been objected to by Chevalier (1932) and Hubard (1950). Tateoka (1963) isolated *O. coarctata* from other species of *Oryza* and recognised a section for its own. Actually such an alternative was originally envisaged by Roschevicz (1931). He remarked that "besides the general features characterizing the whole section, *O. coarctata* Roxb. shows a series of special features, peculiar only to this species, such as reticulate structure of the leaf sheaths, leathery texture of the leaf blade, winged keel, lengthwise stripiness of the flowering glumes representing a series of small linear pores, shape of the fruits etc. so that it might be possible to single out this species into an independent section. It is only in view of the insufficient material that we refrain from doing so."

On the other hand, as far back as 1851, this species was excluded from *Oryza* altogether, and a separate genus *Sclerophyllum* was erected for it by Griffith (1851). According to him "this plant I have understood, but on no satisfactory grounds, was known to Hamilton by the name *Oryza coarctata*. It differs from the genus in the consistence of the palea, in the arista being continuous, in the stamina being exserted, still more in the long stalk of the ovary and perhaps in the ovulum, which appears to have at least one loose membranous coat but on this I am not certain. And it is so distinct in habit that I have little doubt of its being a new genus. It is not as nearly allied to *Oryza* as *Zizania ciliaris* which differs from *Oryza* in having no glumes whatever, a difference of less importance as there is a tendency to their suppression in rice itself. Our plant besides has not the cup-shaped apex of the pedicel which both the others have."

In all the taxonomic publications after 1851, Griffith's views on this species have not been properly cited in synonymy (*see* Hooker 1897; Roschevicz, 1931; Chatterjee, 1948). Griffith (1851) accepted *Sclerophyllum coaractatum* as the correct name for this species and cited *O. triticoides* and *O. coarctata* as synonyms only. The ambiguity appears to have crept in because Griffith's (l.c.) description of this species is immediately preceded by "*Oryza triticoides*? Pl. CLII, Fig. I, *O. coaractata* Buch.-Ham." It should, however, be remarked that these names are cited in synonymy; the only name acceptable to Grriffith being *Sclerophyllum Coarctatum*. It is evident from an earlier mention (on the same page) of this combination when he lists the Indian hexandrous grasses starting with names acceptable to him and listing the synonyms subsequently. This fact as well as the unambiguous protologue cited above should be taken into proper consideration along with the allowance that so far as the requirements of the Code are satisfied, a rigid conventional style is too much to be expected in this posthumus publication of a manuscript.

It might be desirable to comment here about the combination *O. sativa* L. var. *coarctata* (Roxb.) Watt as well. This combination of Watt was published in 1891. As late as November 1890, Watt had no specimen of *O. coarctata* Roxb. (vide Appendix I). This point is also evident from his description (Watt. 1891). One of the reasons of his confusion was also due to the *Genera Plantarum* which, by mistake (*see* Hooker, 1897), mentioned *O. coarctata* as a Himalayan species. Watt presumed this species to be a close ally of *O. sativa* L. and characterized it by the absence of hairs at the base of the panicle branches, short awns and adaptation to brackish water. The study of the herbarium specimens commented by him as well as his publication (Watt, 1891) indicate that he did not have any particular specimen to be identified as *O. coarctata* or to be named as *O. sativa* var. *coarctata*. All he had were some forms of *sativa* complex which he suspected to have originated from *O. coarctata*.

APPENDIX I

The Herbarium at Forest Research Institute, Dehra Dun has a letter attached to a specimen (s.n.) collected by J. F. Duthie in 1890. The letter is written by G. W. Watt from Simla on 20th November 1890 and addressed to J. F. Duthie. It reads as follows: "On working through the Sharanpur specimens of *Oryza*, I have come across... I am in great trouble regarding *O. coarctata* Griff. versus Roxb. I have no book describing it. The *Genera Plantarum* says it is a Himalayan species. Clarke sends me a specimen from Parisnath, Behar and calls it "rock rice" or *O. coarctata* Griff. You have three sheets of the same plant named *O. granulata* Nees, one from Brandis ex Simons Assam, another from Herb. Wight Courtallum 1835 and a third from Brandis Pegu. King sends me two sheets of the same plant and like yours named *O. granulata* Nees. One Kurz's collection from Rajmahal, the other also Kurz's from the little Ranjeet Valley. The last mentioned is the only indication of the Himalayan habitat but *Genera Plantarum* must be wrong to restrict it to the Himalayas. But is it *O. coarctata* or *O. granulata* and if the former, is it *O. coarctata* Roxb. or Griff.? I have no books to help me so please kindly give me your opinion."

TABLE I

CONTRASTING CHARACTERS OF *ORYZA* L. AND *SCLEROPHYLLUM* GRIFF.

Character	*Oryza*	*Sclerophyllum*
Rhizome	Small, thick and woody with closely packed internodes or bulbose or stoloniferous.	Thin, long, polished and branched.
Leaf sheath	Striate on outer surface.	Reticulate on outer surface.
Leaf lamina	Herbaceous and smooth or rigidulous. Apex acute ; Margins closely and not prominently spinulose.	Thick with waxy coating. Apex acuminate. Margins sparsely but prominently spinulose.
Leaf anatomy in T.S. (a)	Vascular bundles arranged in one layer.	Vascular bundles in two layers.
Pedicel cup	Made up of two lobes which overlap each other and obscure the pedicel tip.	Made up of two hyaline lobes which do not overlap each other and lie much below the pedicel tip.
Pedicel tip	As wide as or less wide than the region below the pedicel cup.	Much wider than the region that is below the pedicel cup, thus giving a clavate appearance to the pedicel.
Rachilla	Straight or oblique, but thin.	Straight, thick and stout.
Lemma and palea	5-nerved lemma and 3-nerved palea.	9-nerved lemma and 5-nerved palea.
Surface of lemma and palea (b)	Punctulate, stomata never seen.	Smooth, covered with stomata.
Keel of fertile lemma	Not winged.	Prominently winged.
Awn anatomy	Circular in cross-section. Scalariform cells present only in the outer layer.	Elliptical in cross-section. Scalariform cells completely covering the whole area.
Lodicules	Small.	Very large.
Embryo	Very small (2 mm) and occupies a small position in kernel.	Embryo large and occupies half the length and circumference of kernel.
Base of embryo (c)	Petiole-like attachment present.	Petiole-like attachment absent.
Anatomy of embryo (c)	Lower part of scutellum free from coleorhiza.	Lower part of scutellum fused with coleorhiza.
Habitat	Not adapted to brackish water.	Adapted to brackish water only.

(a) Tateoka (1963), (b) Kihara and Katayama (1960) and (c) Tateoka (1964).

ACKNOWLEDGEMENTS

We are grateful to Dr. B. P. Pal, Director and Dr. M. S. Swaminathan, Head of the Division of Botany, Indian Agricultural Research Institute, New Delhi for their interest and encouragement. The senior author wishes to record the generosity of the Ministry of Education for grant of a scholarship during this period.

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